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The role of invertebrates and aquatic fungi on the decomposition of eucalyptus leaves in streams

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Leaves entering in streams are subject to physical abrasion, invertebrate fragmentation and microbial degradation. Fungi, particularly aquatic hyphomycetes, dominate microbial leaf decomposition and condition the leaves, increasing their palatability for invertebrate shredders. The aim of this work was to study the relative role of invertebrates and aquatic fungi on leaf decomposition of *Eucalyptus globulus* Labill. in two rivers of Northwest Portugal with different water chemistry. For that purpose, leaf decomposition was followed in coarse-mesh and fine-mesh bags.

Physical, chemical and microbial analyses of the stream water, as well as, biotic indices and diversity measures applied to the invertebrates associated with leaves showed that the Guisande River had better water quality than the Este River. Decomposition rates of eucalyptus leaves were significantly higher in the Guisande River ($k = 0.019$ to $0.029\ d^{-1}$) than in the Este River ($k = 0.009$ to $0.011\ d^{-1}$). Significantly higher fungal biomass (up to 790 μg ergosterol g^{-1} AFDM) and sporulation rates (up to 370 conidia mg^{-1} AFDM d^{-1}) occurred in the Guisande River in comparison with the Este River (fungal biomass up to 280 μg ergosterol g^{-1} AFDM; sporulation rates up to 90 conidia mg^{-1} AFDM d^{-1}). Correspondence analyses applied to aquatic hyphomycete and invertebrate assemblages discriminated the two rivers and higher richness in taxa was found in the Guisande River. In this river, leaf decomposition rate was significantly higher in coarse-mesh than in fine-mesh bags. However, in the Este River no significant differences were found between coarse-mesh and fine-mesh bags, which can be attributed to the absence of shredders and low current velocity in this river.